

CLAIMS

1. A method of manufacturing a retainer for a roller bearing which is made of a metal plate and has a tubular main portion, a plurality of pockets formed in the main portion intermittently concerning a circumferential direction and capable of retaining rollers rollably on respective inner sides thereof, and an outwardly oriented flange-like collar portion formed at an axial end of the main portion, comprising the steps of:

forming an annular intermediate material by subjecting the metal plate to die cutting;

forming a second intermediate material by forming a plurality of through holes in the intermediate material intermittently concerning the circumferential direction;

plastically deforming a portion of the second intermediate material excluding a radially outer end portion thereof into a tubular shape; and

forming the portion plastically deformed into the tubular shape as the main portion, forming a portion corresponding to the radially outer end portion of the second intermediate material as the collar portion or a collar portion element for forming the collar portion, and forming portions corresponding to the through holes as the pockets.

2. A method of manufacturing a retainer for a roller bearing

which is made of a metal plate and has a tubular main portion and a plurality of pockets formed in the main portion intermittently concerning a circumferential direction and capable of retaining rollers rollably on respective inner sides thereof, comprising the steps of:

forming an annular intermediate material by subjecting the metal plate to die cutting;

forming a second intermediate material by forming a plurality of through holes in the intermediate material intermittently concerning the circumferential direction;

plastically deforming a portion of the second intermediate material excluding a radially outer end portion thereof into a tubular shape;

cutting off the radially outer end portion; and

forming the portion plastically deformed into the tubular shape as the main portion, and forming portions corresponding to the through holes as the pockets.

3. The method of manufacturing a retainer for a roller bearing according to claim 1, wherein portions which are each present between a central hole of the second intermediate material and each of the through holes are each formed in an arch shape in which a respective intermediate portion projects in a radial direction of the second intermediate material relative to both end portions, and

the arch-like portion is extended when the portion of the second intermediate material excluding the radially outer end portion thereof is plastically deformed into the tubular shape.

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4. The method of manufacturing a retainer for a roller bearing according to claim 1, wherein a portion of an outer peripheral edge of the intermediate material is left as connected to a portion of the metal plate when the annular intermediate material
10 is formed by subjecting the metal plate to die cutting, and

after the second intermediate material is formed by forming the plurality of through holes at least in the intermediate material, a portion of an outer peripheral edge of the second intermediate material is cut off from the portion
15 of the metal plate.

5. The method of manufacturing a retainer for a roller bearing according to claim 1, wherein after the formation of the main portion and the plurality of pockets, those portions of the
20 main portion corresponding to portions which are each present between a central hole of the second intermediate material and each of the through holes are subjected to plastic working, to thereby render the plate thickness of the portion subjected to the plastic working greater than the plate thickness of a
25 remaining portion of the main portion.

6. The method of manufacturing a retainer for a roller bearing according to claim 2, wherein portions which are each present between a central hole of the second intermediate material and each of the through holes are each formed in an arch shape in which a respective intermediate portion projects in a radial direction of the second intermediate material relative to both end portions, and the arch-like portion is extended when the portion of the second intermediate material excluding the radially outer end portion thereof is plastically deformed into the tubular shape.

7. The method of manufacturing a retainer for a roller bearing according to claim 2, wherein a portion of an outer peripheral edge of the intermediate material is left as connected to a portion of the metal plate when the annular intermediate material is formed by subjecting the metal plate to die cutting, and after the second intermediate material is formed by forming the plurality of through holes at least in the intermediate material, a portion of an outer peripheral edge of the second intermediate material is cut off from the portion of the metal plate.

8. The method of manufacturing a retainer for a roller bearing according to claim 2, wherein after the formation of the main

portion and the plurality of pockets, those portions of the main portion corresponding to portions which are each present between a central hole of the second intermediate material and each of the through holes are subjected to plastic working, to thereby render the plate thickness of the portion subjected to the plastic working greater than the plate thickness of a remaining portion of the main portion.

9. A retainer for a roller bearing which is made of a metal plate, comprising:

a tubular main portion;

a plurality of pockets formed in the main portion intermittently concerning a circumferential direction and capable of retaining rollers rollably on respective inner sides thereof; and

an outwardly oriented flange-like collar portion formed at an axial end of the main portion,

wherein an annular intermediate material is formed by subjecting the metal plate to die cutting, and after a second intermediate material is formed by forming a plurality of through holes in the intermediate material intermittently concerning the circumferential direction, a portion of the second intermediate material excluding a radially outer end portion thereof is plastically deformed into a tubular shape,

whereby the portion plastically deformed into the tubular

shape is formed as the main portion, a portion corresponding to the radially outer end portion of the second intermediate material is formed as the collar portion or a collar portion element for forming the collar portion, and portions
5 corresponding to the through holes are formed as the pockets.

10. A retainer for a roller bearing which is made of a metal plate, comprising:

a tubular main portion; and

10 a plurality of pockets formed in the main portion intermittently concerning a circumferential direction and capable of retaining rollers rollably on respective inner sides thereof,

wherein an annular intermediate material is formed by
15 subjecting the metal plate to die cutting, and after a second intermediate material is formed by forming a plurality of through holes in the intermediate material intermittently concerning the circumferential direction, a portion of the second intermediate material excluding a radially outer end portion
20 thereof is plastically deformed into a tubular shape, the radially outer end portion being subsequently cut off,

whereby the portion plastically deformed into the tubular shape is formed as the main portion, and portions corresponding to the through holes are formed as the pockets.

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11. The retainer for a roller bearing according to claim 9,
wherein after the formation of the main portion and the plurality
of pockets by plastically deforming the portion of the second
intermediate material excluding the radially outer end portion
5 thereof into the tubular shape, those portions of the main portion
corresponding to portions which are each present between a
central hole of the second intermediate material and each of
the through holes are subjected to plastic working, to thereby
render the plate thickness of the portion subjected to the plastic
10 working greater than the plate thickness of a remaining portion
of the main portion.

12. The retainer for a roller bearing according to claim 10,
wherein after the formation of the main portion and the plurality
15 of pockets by plastically deforming the portion of the second
intermediate material excluding the radially outer end portion
thereof into the tubular shape, those portions of the main portion
corresponding to portions which are each present between a
central hole of the second intermediate material and each of
20 the through holes are subjected to plastic working, to thereby
render the plate thickness of the portion subjected to the plastic
working greater than the plate thickness of a remaining portion
of the main portion.